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Arrangement for Guiding Individual Reinforcement Filaments

The invention relates to an arrangement for guiding individual reinforcement filaments onto a carrier which can be advanced in the direction of the carrier axis.

An arrangement is known, for example, from DE 198 46 852 C2 and is used especially for a bobbin creel for working in individual reinforcement filaments into a hose blank. A rubber hose is extruded onto a mandrel in an endless method. A dense layer of filaments is spiraled onto this first rubber layer in that a bobbin creel rotates about the carrier formed of mandrel and rubber hose. By advancing the carrier in the axial direction thereof, a spirally-shaped filament layer is formed having a filament angle which is dependent upon the advancing speed and the rotational speed of the bobbin creel.

From DE 198 46 852 C2, it is known that the filaments are guided through a row of holes which are arranged equidistantly from each other on a peripheral line of a positioning ring. One reinforcement filament is guided radially inwardly through each hole. The positioning ring concentrically surrounds or encloses a rotation-symmetric, funnel-shaped deflecting element. The deflecting element has a continuously tapering channel having an annularly-shaped inlet opening and a smaller annularly-shaped outlet opening. The reinforcement filaments are guided on the radially inner surface of the deflecting element onto the carrier which is surrounded by the deflecting element.

It has been shown that threading through holes is very work intensive. Furthermore, the reinforcement filaments run freely and unguided between the holes in the positioning ring and the carrier on a relatively long radial inner surface. This is so

because the positioning ring must have a large diameter in order to accommodate all bores. In this way, no constant spacing of the reinforcement filaments on the carrier can be ensured. In addition, it is possible that individual reinforcement filaments cross over each other.

The object of the invention is therefore to provide an improved arrangement for guiding individual reinforcement filaments with which the above disadvantages are solved.

The object is solved by:

a positioning disc having a plurality of filament guides arranged distributed on the circular ring of the positioning disc; and,

a rotation-symmetrical deflecting element.

The positioning disc and the deflecting element each surround the carrier concentrically. The deflecting element is mounted within the positioning disc and is aligned axially to the positioning disc. The peripherally-extending inner edge of the deflecting element faces at the inlet end toward the carrier and is curved and the filament guides of the positioning disc open directly at the end face of the curved inner edge.

The diameter, on which the reinforcement filaments are guided, can be significantly reduced by the use of a positioning disc with slots in lieu of a position ring with bores. The positioning disc surrounds the deflecting element. In this way, the distance is considerably reduced on which the reinforcement filaments run free and unguided between the filament guides and the carrier and a migration and crossing of the filaments is prevented. The work intensive threading of the reinforcement filaments in the bores is substituted by the better and more rapid placement of the filaments in the slits.

Advantageously, the filament guides are configured of struts or webs extending radially or mounted inclined. In this way, the number of reinforcement filaments, which are guidable with the arrangement, is considerably increased compared to bores because only a strut with a low thickness is needed between the slits and the reinforcement filaments can be easily placed in the slits.

Preferably, a circular band-shaped cover disc can be releasably, for example, magnetically, mounted on the surface of the positioning disc in the region of the filament guides. The cover disc prevents that the filaments slip out of the filament through-guide openings, especially the slits.

For threading reinforcement filaments into the arrangement when preparing a spiralizing arrangement, it is advantageous when a cover disc with a slit, which extends radially, is mounted on the surface of the positioning disc in the region of the filament through-guide openings. In the area of the slit, reinforcement filaments can be threaded in this manner while the already threaded reinforcement filaments are reliably held by the cover disc. The cover disc is preferably magnetically adherable to the positioning disc especially for facilitating the preparation operation and can be rotated from slit to slit.

The invention will be explained in greater detail below with respect to the attached drawings.

FIG. 1 shows a cross-sectional view of the arrangement of the invention for guiding individual reinforcement filaments;

FIG. 2 is a front view of the arrangement of FIG. 1;

FIG. 3 is a detail view of a portion of FIG. 2.

FIG. 1 shows an arrangement 1 for guiding individual reinforcement filaments 2 onto a carrier 3 which is advanced in the direction of the carrier axis X. The carrier 3 is

concentrically surrounded by the arrangement 1.

The arrangement 1 has a positioning disc 4 having a plurality of filament guides which are configured as struts extending radially outwardly. The filament guides are distributed equidistantly from each other on the circular ring of the positioning disc 4.

A rotational symmetrical deflecting element 5 is axially mounted below the positioning disc 4. The inner edge 6 of the deflecting element 5 faces the carrier 3 on the run-in side and is curved so that the reinforcement filaments 2 are deflected at an angle onto the carrier 3. The filament guides of the positioning disc 4 are mounted in such a manner with respect to the deflecting element 5 that the reinforcement filaments 2 are guided directly to the end face of the curved inner edge 6 and the distance is shortened in which the filaments 2 run freely from the filament guides to the carrier 3. Furthermore, a lateral migration and overlayering of the filaments 2 is prevented by a small deflecting surface of the inner edge 6 and a very small air gap to the carrier 3.

In the embodiment shown, the deflecting element 5 is in the form of a sleeve pushed into the positioning disc 4.

FIG. 2 shows a front view of the arrangement 1. A circular annular cover disc 7 is magnetically adherable to the surface of the positioning disc 4 in the region of the filament guides. The cover disc 7 has an assembly slit 8 in order to clear at least one selected filament guide and to make possible a threading of a reinforcement filament 2 into the filament guide on the carrier 3. For preparing a bobbin creel, the cover disc 7 is successively rotated and the reinforcement filaments 2 are sequentially guided through the corresponding filament guides.

The cover disc 7 prevents that already threaded reinforcement filaments 2 can again become disengaged from the filament passthrough opening.

FIG. 3 shows a detail view of the positioning disc having a magnetically adhered cover disc 7. The filament guides 9 can be seen in the region of the assembly slit 8 of the cover disc 7. The filament guides 9 are formed by struts extending radially outwardly. The reinforcement filaments 2 can therefore be easily placed in the slits.